

APPENDIX A

PROCEDURES FOR CHANGE-OUT OF CHLORINE CYLINDERS

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PART I: Removal of Cylinder

Assumptions:

- ***Replace west cylinder with chlorinator #1 in service (valves G3, G8, G4, S2, W4, G10, Gil, and G12 are closed to supply chlorinator #1).***
- ***Serviceman and operator wear coveralls.***

1. Notify the 384 Powerhouse and the Hanford Fire Department that the chlorine cylinder change-out is in progress.
2. Start the 315B Building vent **fan** and operate it for three (3) minutes before entering. Maintain the vent fan continuously. (Alarms operate at 1 and 5 **ppm**.)
3. Enter through the walk-through door.
4. Identify the empty cylinder by its weight, and verify the indication of no flow on the cylinder regulator.
5. Close the angle (root) valve on the chlorine cylinder.
6. Isolate the automatic **switchover** valve. (Close valves G5, G6, and G9.)
7. Verify that valves G8 and G4 are closed.
8. **Verify** that valve G 1 is open, and open valve G3. Wait two (2) minutes and verify that there is no flow at the chlorinator in service. Verify that the high-vacuum alarm is actuated.
9. Close valves G 1 and G3. Open valves G6 and G9, and verify that the high-vacuum alarm clears.
10. Chlorine serviceman dons the **facemask**, and operator dons self-contained breathing apparatus (**SCBA**). Then they verify the operation of the personal protective equipment.
11. Slowly disconnect the regulator, check it for **leaks**, and set it on the floor.

12. **Install** the cap on the cylinder angle valve, and install the protective hood.
13. Position the crane and cylinder truck for loading; open the roll-up door; remove the chocks; and push the cylinder out to the stops.
14. Release the chain binders, and turn the cylinder over to the hoist and rigging crew.
15. Install the spreader bar, lift the cylinder, and place it on the flatbed truck.
16. Secure the cylinder and transport it.
17. Close the roll-up door, and exit through the walk-through door.

PART II: Installation of Replacement Cylinder

1. Turn on or verify that the storage room exhaust fan is on.
2. Position the crane for unloading.
3. Position the chlorine transport truck for unloading.
4. Verify that the chlorine cylinder trolley is in position to receive the cylinder.
5. Release the cylinder binder(s) on the transport vehicle.
6. Install the lifting bar, and lift the cylinder.
7. Place the cylinder on the trolley.
8. Remove the lifting bar, removing it from the immediate area.
9. Secure the cylinder to the trolley with chain binders (2).
10. Enter through the walk-through door, and open the roll-up door.
11. Push the trolley and the chlorine cylinder into the building and against the rail stop. Install the wheel chocks.
12. Request the chlorine serviceman to remove the protective hood from the chlorine cylinder.
13. Observe the position of the cylinder angle valves. If the valves are not in vertical alignment, **loosen** the chain binders and rotate the cylinder to obtain vertical alignment of the valves, and then tighten the chain binders.
14. Chlorine serviceman dons the facemask respirator, and operator dons self-contained **breathing** apparatus (**SCBA**) equipment. Then they verify the operation of the personal protective equipment.
15. Verify that the chlorine cylinder gas angle valve is closed.
16. Check for leaks while slowly removing the protective cap from the cylinder gas angle valve.
17. Clean the sealing surface of the gas angle valve and the vacuum regulator. Visually inspect the regulator valve body for damage.

18. Install a new lead **seal**. Attach the regulator to the cylinder gas valve, and secure it in place by tightening the yoke assembly.
19. Check for leaks. Slowly open the chlorine cylinder gas supply valve.
20. Adjust the cylinder weight **scale** to indicate 2,000 pounds of product available in the cylinder.
21. Open system supply valves **G1** and **G5**.
22. Record in the log book the chlorine cylinder identification number and the **scale** weight.
23. Report any deficiencies to the supervisor for initiation of **necessary** corrective action.
24. Notify the Hanford Fire Department and the 384 Powerhouse that the chlorine cylinder change-out activities are complete.
25. Close the roll-up door, and exit through the walk-through door.